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## Description

## Railway bogie

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The invention relates to a railway bogie comprising at least two spring units per one wheel and a bogie frame.

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From UIC standard a bogie with helical springs is well known, whereby the axlebox suspension consists of helical springs in combination with friction damping. Thereby the springs rest on support arms integral with the lower part of the axlebox housing and are connected with the bogie frame using caps integral with the bogie frame for taking up the top of the springs.

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US 2002-0089102 A1 discloses a hydraulic spring comprising a membrane. Therein it is also disclosed that said hydraulic spring is for use in rail vehicles especially as a primary spring.

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Further the catalogue of the company ContiTech Luftfedersysteme GmbH in Hannover, Germany, "Air Spring Systems for Modern Rail Vehicles", printed and distributed in October 1998 discloses the use of hydraulic springs comprising a membrane in two-axle bogies.

30

One object of the present invention is to provide an improved railway bogie comprising at least two spring units per one wheel and a bogie frame, so that

various types of spring units in connection with also various types of axleboxes having all diverse dimensions can be connected to the bogie frame having standardized dimensions in an easy and reliable manner.

5 The object of the invention is achieved by the subject of claim 1. Preferable embodiments are described in the dependent claims.

According to claim 1 a railway bogie comprising at least two spring units per one wheel and a bogie frame is characterized by an essentially single piece adapter  
10 which bridges said spring units and is arranged between said spring units on the one side and said bogie frame on the other side.

So the adapter is used in an advantageous manner to adapt various types of spring units in connection with various types of axleboxes having all diverse dimensions to  
15 the bogie frame having standardized dimensions without the need of modifying the bogie frame. Just the adapter is modified according to the used type of spring units and axlebox, whereby any modifying of the adapter can be done more easily and in a more cost-efficient way than it could be done with the bogie frame itself.

20 With the accurately pre-fabricatable adapter it can further be assured that the two spring units are mounted to the bogie frame exactly with a prescribed distance between the principal axes of the two spring units, whereby every deviation from said prescribed distance would result in a tangential deviation of the spring units and therewith in an undesirable modification of the spring characteristic.

25 Further advantages, features and details of the invention are described with respect to one preferred embodiment of the invention with reference to the drawings wherein:

Figure 1 is a longitudinal cross section in the region of one wheel of a bogie and

Figure 2 is a sectional view along the line BB of Figure 1.

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Figure 1 shows a longitudinal cross section in the region of one wheel 2 of a bogie of the so-called Y 25 type, whereby the cut is directed according to a plane being defined by the axes of rotational symmetry of a first and second hydraulic spring. The pictured section of the bogie comprises an axlebox 10 with a rolling bearing 4  
10 mounted in a middle region of the axlebox 10. The rolling bearing 4 supports one end of one of the two axles of the bogie.

A base of the axlebox 10 is extended to the left and the right side forming a cup shaped region 12 at each of said sides. Each of said hydraulic springs comprises a  
15 spring element 20, which is attached to each of said cup shaped regions 12 of the axlebox 10. A metallic centrepiece 26 is located in the centre of each of the spring elements 20.

These two centrepieces 26 are attached to one bridging adapter 50. Therefore the  
20 centrepieces 26 and the bridging adapter 50 have bores for connecting the centrepieces 26 with the bridging adapter 50 via two bolts 52 pictured uncut in Figure 1 and 2. In other embodiments the bolts 52 can be integral parts of the centrepieces 26 or of the bridging adapter 50 or the centrepieces 26 can be connected to the bridging adapter 50 by any other connecting means.

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The bridging adapter 50 is attached to a longeron of a frame 6 of the bogie, whereby this longeron extends in a longitudinal direction parallel to the rails and is pictured uncut in Figure 1. Preferably the bridging adapter 50 is connected to the bogie frame 6 by welding.

In the following just that left cup shaped region 12 in connection with the left spring element 20 is described in detail, because the same applies to the right cup shaped region 12 in connection with the right spring element 20. Therefore Figure 2 shows a sectional view along the line BB of Figure 1. The spring element 20 comprises sleeve shaped elastomeric elements 22 and intermediate sleeve shaped metallic elements 24 in an alternating succession, whereby the elastomeric and the metallic elements 22 and 24 are connected by way of vulcanisation. Also the centrepiece 26 is connected by way of vulcanisation to its adjacent elastomeric element 22.

The spring element 20 is secured to the respective cup shaped region 12 of the axlebox 10 via a sealing ring 42, which is attached to the axlebox 10 via screws 44. In other embodiments the spring element 20 also can be directly vulcanised to the cup shaped region 12. The spring elements 20 forms together with the respective cup shaped region 12 of the axlebox 10 a volume for a fluid 30 particularly a hydraulic fluid. This volume is at least partly filled with the fluid 30. The centrepiece 26 is prolonged into said volume forming a plunger shaped region 28. Thereby at least a disk shaped region at the end of the plunger shaped region 28 is dipped into the fluid 30, so that this arrangement fulfils the function of a damper. So the cup shaped region 12 of the axlebox 10 together with the respective spring element 20 and the fluid 30 form together the hydraulic spring.

In another embodiment of the invention a hydraulic spring can be used, e.g. according to the already cited US 2002-0089102 A1, comprising a membrane instead of the plunger shaped section 28 of the centrepiece 26, whereby the cup shaped region 12 of the axlebox 10 is then also one part of the housing of the hydraulic spring.

DE 04 008 PCT

**List of reference signs**

5		
	2	wheel
	4	rolling bearing
	6	bogie frame
10	10	axlebox
	12	cup shaped region
	20	spring element
	22	elastomeric element
15	24	metallic element
	26	centrepiece
	28	plunger shaped region
	30	fluid
20		
	42	sealing ring
	44	screw
	50	bridging adapter
25	52	bolt

## Claims

1. Railway bogie comprising at least two spring units per one wheel and a bogie frame characterized by an essentially single piece adapter which bridges said spring units and is arranged between said spring units on the one side and said bogie frame on the other side.
2. Railway bogie of claim 1, whereby said bogie is of the Y 25 type.
3. Railway bogie of one of the claims 1 or 2, whereby at least one of said spring units comprises a hydraulic spring.
4. Railway bogie of one of the claims 1 to 3, whereby said adapter is attached to said bogie frame especially by welding.
5. Railway bogie of one of the claims 1 to 4, whereby said adapter is connected to at least one of said spring units via at least one bolt.
6. Railway bogie of claim 5, whereby said bolt is an integral part of said adapter or said spring unit.

7. Railway bogie of one of the claims 1 to 6, whereby said adapter is designed to fit to said bogie frame having standardized dimensions.
8. Railway bogie of one of the claims 1 to 7, whereby said adapter has an  
5 essentially rectangular cross section.
9. Railway bogie of one of the claims 1 to 8, whereby said adapter extends oblong in a direction in which said adapter bridges said spring units.

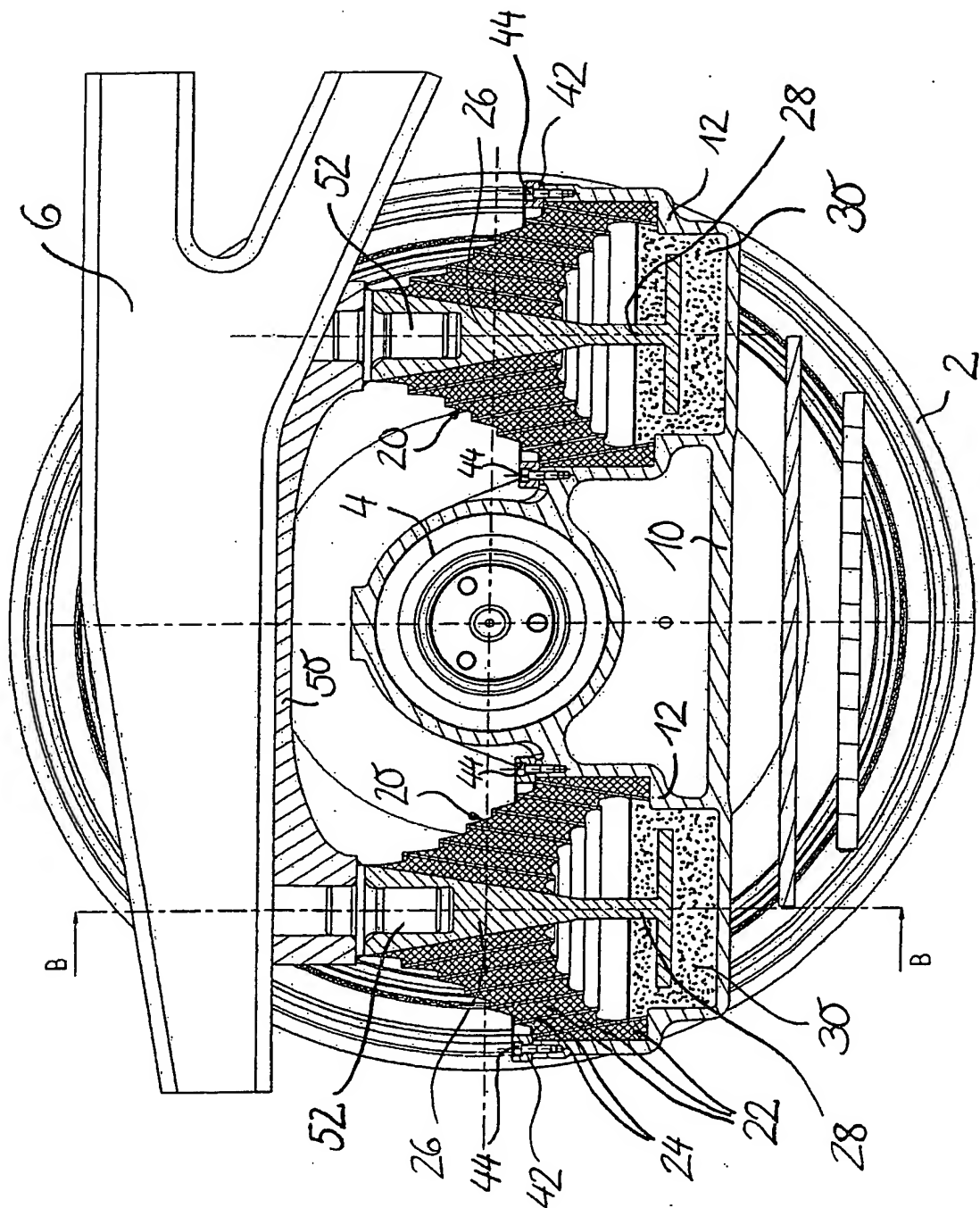


FIG 1



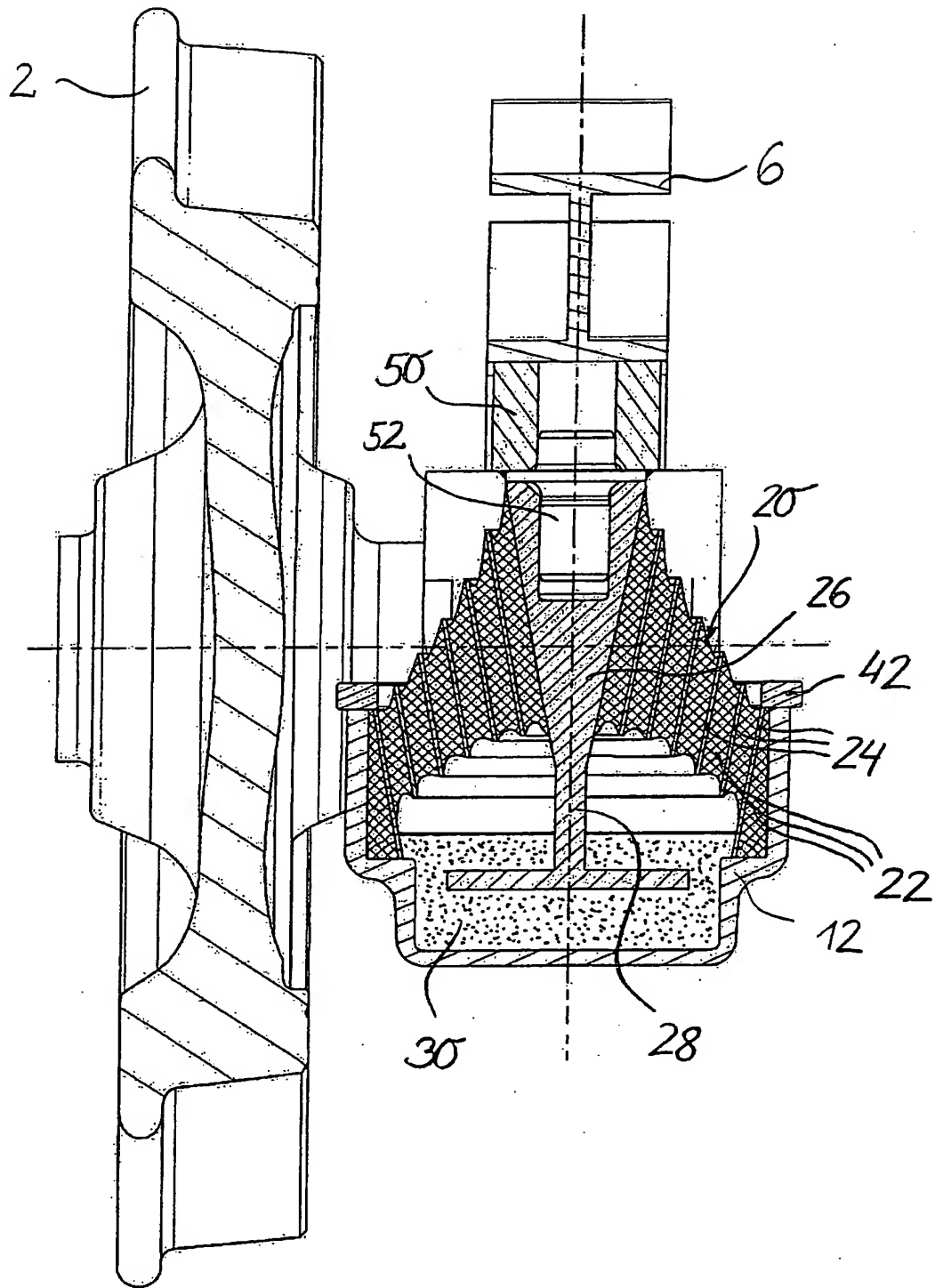


FIG 2

# INTERNATIONAL SEARCH REPORT

PCT/EP2004/003199

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B61F5/26 B61F5/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 B61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 874 728 A (GEORGE SPENCER MOULTON & COMPANY LIMITED; DISTINGTON ENGINEERING COMPA) 10 August 1961 (1961-08-10) page 2, lines 9-14; figure 3	1,9
A	DE 12 30 834 B (LINKE-HOFMANN-BUSCH G.M.B.H) 22 December 1966 (1966-12-22) figure 2	1
A	US 3 920 231 A (HARRISON ET AL) 18 November 1975 (1975-11-18) abstract; figures	3

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

31 January 2005

Date of mailing of the international search report

14/02/2005

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## INTERNATIONAL SEARCH REPORT

PCT/EP2004/003199

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 874728	A	10-08-1961	NONE	
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US 3920231	A	18-11-1975	GB 1429308 A	24-03-1976
			AU 469387 B2	12-02-1976
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			IT 986976 B	30-01-1975

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